

Claims

We claim:

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a/ 5

1. A head-mounted projection display apparatus comprising:  
a display panel to generate an image;  
an optic system to receive the generated image and to extend the optical path of the generated image by reflection of the image within the optic system, the optic system transmitting a projection image; and  
a viewing surface to receive the projection image from the optic system, the image on the viewing surface being viewable by a user.
2. The apparatus of Claim 1 wherein the display panel is an active matrix display panel.
3. The apparatus of Claim 1 wherein the display panel includes a polarizer to polarize the generated image in a first orientation, the optic system processing the image in the first orientation to a second orientation for receipt by the viewing surface.
4. The apparatus of Claim 3 wherein the image is processed by reflection with the optic system.
5. The apparatus of Claim 1 wherein the optic system comprises:  
a first partially-transmissive mirror having a light transmissive first surface to transmit the generated image into the optic system and a reflective second surface to alter the

polarization of light incident on the first surface;

5 an element to reflect light having a first polarization back toward the second surface of the first mirror and to transmit light having a second polarization.

6. The apparatus of Claim 5 wherein the first mirror is a concave mirror.

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a2  
10 → 7. The apparatus of Claim 5 wherein the element is a cholesteric liquid crystal element.

8. The apparatus of Claim 5 wherein the second surface of the first mirror alters light of the first polarization of light of the second polarization.

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a3  
15 → 9. The apparatus of Claim 1 wherein the viewing surface is an optical combiner which combines the projection image with a viewing image.

10. The apparatus of Claim 9 wherein the viewing image is a direct view image.

20 11. The apparatus of Claim 9 wherein the optical combiner is a partially transmissive mirror.

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